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EXAMINER	
JARRETT, RYAN A	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/672,527	AHMED, OSMAN
	Examiner	**Art Unit**
	Ryan A. Jarrett	2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 12 July 2007 and 14 August 2007.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,2,5-12,21-24,26,27 and 29-36 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,2,5-12,21-24,26,27 and 29-36 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 11 December 2006 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 08/14/07.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings were received on 12/11/2006. These drawings are acceptable for examination purposes only, due to the informalities of the amendments.

Claim Objections

Claims 29-32 are objected to because of the following informalities: These claims depend from a cancelled claim. Appropriate correction is required.

Response to Arguments

Applicant's arguments, see page 12, filed 03/07/07, with respect to claims 1, 2, and 5-12 have been fully considered. The rejection of claims 1, 2, and 5-12 under 35 U.S.C. 112 2nd paragraph as being indefinite has been withdrawn in light of the amendment to claim 1.

Applicant's arguments, see pages 12-18, filed 03/07/07, with respect to the rejections based on Graviton have been fully considered but they are not persuasive. Examiner does not refute that Graviton teaches control outputs generated by a separate node 70 (page 16 line 30 – page 17 line 9). But this does not mean that Graviton cannot also teach control outputs generated by the sensor assembly 50 processor 60 (see Fig. 4).

Applicant argues that Graviton identifies a completely self-contained sensor/actuator device, and thus there would be no reason for the processor 60 of Graviton to communicate the control signal to another element of the building automation system. However, this is clearly not the case since Graviton identifies a "processor 60" effectuating the control. And, as depicted in Fig. 4 of Graviton, the "sensor assembly 50" including "processor 60" clearly has no actuator associated with it. Rather, the "actuator 90" is associated with the "actuator assembly", which is clearly separate and remote from the "sensor assembly 50". Thus, there would be reason and a necessity for the processor 60 of Graviton to communicate the control signal to another element of the building automation system.

Regarding Graviton as modified by Yamazaki et al., Applicant argues on pages 17-18 that because Graviton does not include or need two substrates, there can be no reason to modify Graviton to include a battery between to substrates. This is not found persuasive since such a "need" or motivation can come from the secondary reference. Examiner stated that such a modification would be desirable since Yamazaki et al. teaches that disposing a sheet battery between a noise source substrate (e.g., RF circuit of Graviton) and a substrate from which one desires to prevent the effects of noise enables little noise effects to be provided without using an electromagnetic shielding plate (e.g., [0060]). So, a second substrate, in combination with the battery and the first substrate, would desirably eliminate the need for an electromagnetic shielding plate.

Applicant's arguments, see pages 18-19, filed 03/07/07, with respect to the rejection(s) of claim(s) 21-24 under 35 U.S.C. 103(a) as being unpatentable over Graviton as modified by Doherty have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Graviton as modified by Yamazaki et al.

Applicant's arguments, see pages 19-24, filed 03/07/07, with respect to the rejections based on Doherty have been fully considered but they are not persuasive.

In response to applicant's argument that the Examiner's proposed modification of placing control in the wireless sensors of Doherty et al. has the net effect of reducing battery life, it is noted the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Applicant also argues that any transmission of measurement information that is eliminated by placing the controller in the sensor is replaced by a transmission of control information. Examiner does not agree since the sensor would previously have to transmit *all measurement data* to the central controller. Whereas, under the proposed modification, this wholesale transmission of data would be eliminated and/or greatly

reduced and replaced with a narrowly targeted transmission of control information. This is because, under the proposed modification, particular sensors would transmit particular control signals to particular actuators. There would not be a wholesale transmission of measurement data from each sensor as before. Therefore, unnecessary communications would be reduced.

Applicant argues on page 23 that Examiner never provided a reason to modify Doherty to include a second substrate. However this is not the case since Examiner stated that such a modification would be desirable since Yamazaki et al. teaches that disposing a sheet battery between a noise source substrate (e.g., RF circuit of Doherty) and a substrate from which one desires to prevent the effects of noise enables little noise effects to be provided without using an electromagnetic shielding plate (e.g., [0060]). So, a second substrate, in combination with the battery and the first substrate, would desirably eliminate the need for an electromagnetic shielding plate.

Regarding Applicant's arguments on pages 23-24 as they relate to Doherty as modified by Hill, it is noted that the memories of Doherty store the program and the data. It is asserted that either of these two items could be construed to read on Applicant's claimed configuration data, particularly Doherty's "program", since a program configures a device to perform a series of actions or a particular type of work. Furthermore, despite applicant's amending of the claim language from "operable to store" to "stores", it is noted that this is still a functional limitation of the memory device. Doherty's memory is capable of storing numerous types of data.

Applicant's arguments, see pages 24-26, filed 03/07/07, with respect to claims 1, 2, 5, 7, and 11 have been fully considered and are generally persuasive. The rejection of claims 1, 2, 5, 7, and 11 under 35 U.S.C. 102(b) as being anticipated by Asada et al. has been withdrawn.

Applicant's arguments, see page 26, filed 03/07/07, with respect to claims 6, 8, and 9 have been fully considered and are persuasive. The rejection of claims 6, 8, and 9 under 35 U.S.C. 103(a) as being unpatentable over Asada et al. in view of Doherty has been withdrawn.

Applicant's arguments, see page 27, filed 03/07/07, with respect to claims 21-24 have been fully considered and are persuasive. The rejection of claims 21-24 under 35 U.S.C. 103(a) as being unpatentable over Asada et al. in view of Doherty has been withdrawn.

Applicant's arguments, see page 27, filed 03/07/07, with respect to claims 6, 8-10, and 12 have been fully considered and are persuasive. The rejection of claims 6, 8-10, and 12 under 35 U.S.C. 103(a) as being unpatentable over Asada et al. in view of one of Yamazaki and Hill has been withdrawn.

Applicant's arguments, see pages 27-28, filed 03/07/07, with respect to the rejection of claims 21-24 over Asada et al. in view of Yamazaki have been fully considered but they are not persuasive. Applicant argues that Examiner never provided a reason to modify Asada to include a second substrate. However this is not the case since Examiner stated that such a modification would be desirable since Yamazaki teaches that disposing a sheet battery between a noise source substrate (e.g., RF circuit of Asada) and a substrate from which one desires to prevent the effects of noise enables little noise effects to be provided without using an electromagnetic shielding plate (e.g., [0060]). So, a second substrate, in combination with the battery and the first substrate, would desirably eliminate the need for an electromagnetic shielding plate.

Applicant's arguments, see pages 28-29, filed 03/07/07, with respect to the rejection of claims 26-36 over Asada et al. in view of Hill have been fully considered but they are not persuasive. Asada teaches storing configuration data (e.g., Section 3: "programmable system"), so there is no need to modify Asada as such. Furthermore, despite applicant's amending of the claim language of claim 26 from "operable to store" to "stores", it is noted that this is still a functional limitation of the memory device. Asada's memory is capable of storing numerous types of data, including configuration data and the other claimed data types.

References Relied Upon

WO 00/54237, hereinafter referred to as "Graviton".

Yamazaki et al. US 2001/0033963

L. Doherty, B.A. Warneke, B.E. Doser, and K.S.J. Pister. "Energy and Performance Considerations for Smart Dust". International Journal of Parallel and Distributed Systems and Networks 4.3 (2001): 121-133, hereinafter referred to as "Doherty et al.".

"Brainy Buildings using 'Smart Dust' can Keep Soaring Energy Costs in Check, say UC Berkeley Researchers". UC Berkeley Media Relations 25 May 2001, hereinafter referred to as "UC Berkely".

E. Jacobsen. "The Building Blocks of a Smart Sensor for Distributed Control Networks". Northcon/96 (1996): 285-290, hereinafter referred to as "Jacobsen".

J. Hill, R. Szewczyk, A. Woo, S. Hollar, D. Culler, and K. Pister. "System Architecture Directions for Networked Sensors" ACM Press 35.11 (2000): 93-104, hereinafter referred to as "Hill et al.".

G. Asada, M. Dong, T.S. Lin, F. Newberg, G. Pottie, W.J. Kaiser, and H.O. Marcy. "Wireless Integrated Network Sensors: Low Power Systems on a Chip". Proceedings of the 1998 European Solid State Circuits Conference (1998): 9-16, hereinafter referred to as "Asada et al.".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Rejections based on Graviton

Claims 1, 2, 5, 7, 11, 12, 26, 27, and 29-36 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 00/54237 to Graviton, Inc. ("Graviton"), supplied by the applicant.

Graviton discloses:

1. **An apparatus** (e.g., Fig. 4 #50: "SENSOR ASSEMBLY") **for use in a building automation system, the building automation system including one or more devices that are operable to generated control outputs based on set point information and process value information from one or more sensors, the building automation system further including one or more actuators operable to perform an operation responsive to at least some of the control outputs** (*Statements of intended use in the preamble or statements that don't limit the structure of the claimed "apparatus" are not given patentable weight. The "building automation system including one or more devices" is external to the claimed "apparatus" and is not given patentable weight.*)**, the apparatus comprising:**

at least one microlectromechanical (MEMs) sensor device operable to generate a process value device (e.g., Fig. 4 #52: "CANTILEVER CHIP", pg. 18 lines 16-17: "The various sensors 52, 100 and actuators 92 may be implemented through various microelectromechanical devices, also known as MEMS.");

a processing circuit configured to cause an output digital signal (e.g., Fig. 4 #56: "ADC", Fig. 4 #60: "PROCESSOR") **to be communicated to another element of the building automation system** (e.g., pg. 6 lines 19-29: "The actuator commands may be received via...another sensor assembly"); **and**

wherein the at least one MEMs sensor device and the processing circuit are integrated onto a first substrate (e.g., pg. 15 line 31 – pg. 16 line 3: "The system preferably includes a single chip including both the sensor, required logic components or processing components, e.g., microprocessor, and a wireless transmission component, e.g., radio frequency generator, all included within a single chip. By integrating the sensing, processing (optional memory), and transmission functionalities, the device may be made compact and robust."); **and**

wherein the processing circuit (e.g., Fig. 4 #60: "PROCESSOR") **is further configured to generate the output digital signal including a first control output** (e.g., pg. 6 lines 19-29: "The actuator commands may be received via...another sensor assembly", pg. 27 lines 16-17: "Such control may be effected at a purely local level, such as through the action of the processor 60 itself") **based on at least one set point and the process value obtained from the at least one MEMs sensor device** (e.g., pg. 18 lines 11-15: "the use of humidity and temperature sensors within the system by permitting correction of those effects", *Correcting a temperature effect implies correcting a temperature with respect to a setpoint,* pg. 19 lines 22-23: "For example, a switch actuated by the presence of a...temperature change", *Implies temperature change with respect to a setpoint,* pg. 27 lines 12-16: For example, the sensing of ingredients detects a situation requiring action to ensure that the final products conforms to the specifications, then a feedback or closed loop action may be taken so as to change aspects of the ingredients or the recipe or method of treatment of those ingredients in the process.", *The "specifications" correlate to the claimed "setpoint",* pg. 27 lines 23-25: "In yet another aspect, when a contaminant or other process parameter is detected to be out of specification, an alert or alarm condition may be generated.", *The "specifications" correlate to the claimed "setpoint",* pg. 29 lines 8-13: "process control...error conditions", *An "error condition" is a deviation of a process control value from a setpoint.*).

2. The apparatus of claim 1 wherein the processing circuit includes a microelectronics A/D converter (e.g., Fig. 4 #56: "ADC"), **the microelectronics A/D converter operable to receive the process value from the at least one MEMs sensor device and generate a digital sensor signal therefrom** (e.g., pg. 4 lines 15-24, pg. 15 lines 21-30).

5. The apparatus of claim 1 wherein the at least one MEMs sensor device includes a plurality of MEMs sensor devices (e.g., pg. 15 lines 14-16).

7. The apparatus of claim 1 wherein the first substrate is a semiconductor substrate (e.g., pg. 15 line 31 – pg. 16 line 3).

11. The apparatus of claim 1 further comprising an RF communication circuit operably coupled to the processing circuit (e.g., pg. 15 line 31 – pg. 16 line 3: "radio frequency generator")**, the RF communication circuit operably connected to provide the output digital signal go the other element of the building automation system.**

12. The apparatus of claim 1 further comprising an EEPROM operably coupled to the processing circuit (e.g., pg. 4 line 31 – pg. 5 line 2: "In the preferred embodiment, the sensor assembly containing the digital sensor includes a processor. Such a processor may comprise a microprocessor and associated components including memory (RAM, ROM, mass storage, Flash, optical memory, Biomemory, etc.)", *Flash memory is a type of electronically erasable programmable non-volatile memory.*)**.**

26. An apparatus (e.g., Fig. 4 #50: "SENSOR ASSEMEBLY") **for use in a building automation system, the building automation system including one or more devices that are operable to generate a control output based on set point information and process value information from one or more sensors** (*Statements of intended use in the preamble or statements that don't limit the structure of the claimed "apparatus" are not given patentable weight. The "building automation system including one or more devices" is external to the claimed "apparatus" and is not given patentable weight.*)**, the apparatus comprising:**

at least one microelectromechanical (MEMs) sensor device operable to generate a process value (e.g., Fig. 4 #52: "CANTILEVER CHIP", pg. 18 lines 16-17: "The various sensors 52, 100 and actuators 92 may be implemented through various microelectromechanical devices, also known as MEMS.")**;**

a processing circuit (e.g., Fig. 4 #56: "ADC", Fig. 4 #60: "PROCESSOR") **operably connected to the at least one MEMS sensor device to receive the process value therefrom, the processing circuit configured to convert the process value to an output digital signal** (e.g., pg. 4 lines 15-24, pg. 15 lines 21-30) **configured to be communicated to another element of the building automation system** (e.g., pg. 6 lines 19-29: "The actuator commands may be received via…another sensor assembly")**;**

a programmable non-volatile memory (e.g., pg. 4 line 31 – pg. 5 line 2: "In the preferred embodiment, the sensor assembly containing the digital sensor includes a

processor. Such a processor may comprise a microprocessor and associated components including memory (RAM, ROM, mass storage, Flash, optical memory, Biomemory, etc.)", *Flash memory is a type of programmable non-volatile memory.*), **operably coupled to the processing circuit and supported by the first substrate** (e.g., pg. 15 line 31 – pg. 16 line 3: "The system preferably includes a single chip including both the sensor, required logic components or processing components, e.g., microprocessor, and a wireless transmission component, e.g., radio frequency generator, all included within a single chip. By integrating the sensing, processing (optional memory), and transmission functionalities, the device may be made compact and robust.", *The system preferably includes a single chip including both the processing components and memory, which, as disclosed at pg. 5 line 1 of Graviton, can be a Flash memory.*), **wherein the programmable non-volatile memory stores configuration information relating to the apparatus** (e.g., pg. 16 lines 24-29: "Memory may be utilized…to store program information which achieves the functionality described herein.", *It is further noted that apparatus claims must be structurally distinguishable from the prior art. This is a functional limitation of the "memory". The prior art "memory" of Graviton is capable of storing infinitely many types of information, including configuration information.*); **and**

wherein the at least one MEMS sensor device and the processing circuit are integrated onto a first substrate (e.g., pg. 15 line 31 – pg. 16 line 3: "The system preferably includes a single chip including both the sensor, required logic components or processing components, e.g., microprocessor, and a wireless transmission component, e.g., radio frequency generator, all included within a single chip. By integrating the sensing, processing (optional memory), and transmission functionalities, the device may be made compact and robust.").

27. The apparatus of claim 26, wherein the programmable non-volatile memory comprises an EEPROM (e.g., pg. 4 line 31 – pg. 5 line 2: "In the preferred embodiment, the sensor assembly containing the digital sensor includes a processor. Such a processor may comprise a microprocessor and associated components including memory (RAM, ROM, mass storage, Flash, optical memory, Biomemory, etc.)", *Flash memory is a type*

of electronically erasable programmable non-volatile memory.) **configured to store information generated by an external device selecting less than all of the available functions of the apparatus to be enabled** (e.g., pg. 16 lines 24-29: "Memory may be utilized…to store program information which achieves the functionality described herein.", pg. 24 lines 9-13: "intended function of the device", *It is further noted that apparatus claims must be structurally distinguishable from the prior art. This is a functional limitation of the claimed "memory". The prior art "memory" of Graviton is capable of storing infinitely many types of information, including configuration information generated by an external device.*)**.**

29. The apparatus of claim 28, wherein the configuration information includes identification information for the apparatus (e.g., pg. 24 lines 9-13: "identification number", *It is further noted that apparatus claims must be structurally distinguishable from the prior art. This is a functional limitation of the "memory". The prior art "memory" of Graviton is capable of storing infinitely many types of information, including identification information.*)**.**

30. The apparatus of claim 29, wherein the configuration information includes a network address corresponding to the apparatus (e.g., pg. 24 lines 9-13: "address", *It is further noted that apparatus claims must be structurally distinguishable from the prior art. This is a functional limitation of the "memory". The prior art "memory" of Graviton is capable of storing infinitely many types of information, including network address information.*)**.**

31. The apparatus of claim 28, wherein the configuration information includes function enabling information, the function identifying information identifying as enabled less than all of the possible sensing functions available to be enabled on the sensor (e.g., pg. 16 lines 24-29: "Memory may be utilized…to store program information which achieves the functionality described herein.", pg. 24 lines 9-13: "intended function of the device", *It is further noted that apparatus claims must be structurally distinguishable from the prior art. This is a functional limitation of the claimed "memory". The prior art "memory" of Graviton is capable of storing infinitely many*

types of information, including configuration information generated by an external device.).

32. The apparatus of claim 28, wherein the configuration information includes system RF communication parameters (e.g., pg. 13 line 24 – pg. 14 line 4, pg. 16 lines 24-29: "Memory may be utilized…to store program information which achieves the functionality described herein.", *It is further noted that apparatus claims must be structurally distinguishable from the prior art. This is a functional limitation of the "memory". The prior art "memory" of Graviton is capable of storing infinitely many types of information, including RF communication parameters.*).

33. The apparatus of claim 27, wherein the EEPROM is further operable to store configuration information relating to the apparatus (e.g., pg. 16 lines 24-29: "Memory may be utilized…to store program information which achieves the functionality described herein.", *It is further noted that apparatus claims must be structurally distinguishable from the prior art. This is a functional limitation of the "memory". The prior art "memory" of Graviton is capable of storing infinitely many types of information, including configuration information.*).

34. The apparatus of claim 33, wherein the configuration information includes identification information for the apparatus (e.g., pg. 24 lines 9-13: "identification number", *It is further noted that apparatus claims must be structurally distinguishable from the prior art. This is a functional limitation of the "memory". The prior art "memory" of Graviton is capable of storing infinitely many types of information, including identification information.*).

35. The apparatus of claim 33, wherein the configuration information includes function enabling information, the function enabling information identifying as enabled less than all of the possible sensing functions available to be enabled on the sensor (e.g., pg. 16 lines 24-29: "Memory may be utilized…to store program information which achieves the functionality described herein.", pg. 24 lines 9-13: "intended function of the device", *It is further noted that apparatus claims must be structurally distinguishable from the prior art. This is a functional limitation of the claimed "memory". The prior art "memory" of Graviton is capable of storing infinitely many*

types of information, including configuration information generated by an external device.).

36. The apparatus of claim 27, wherein the EEPROM is integrated on to the first substrate (e.g., pg. 4 line 31 – pg. 5 line 2, pg. 15 line 31 – pg. 16 line 3: "The system preferably includes a single chip including both the sensor, required logic components or processing components, e.g., microprocessor, and a wireless transmission component, e.g., radio frequency generator, all included within a single chip. By integrating the sensing, processing (optional memory), and transmission functionalities, the device may be made compact and robust.", *The system preferably includes a single chip including both the processing components and memory, which, as disclosed at pg. 5 line 1 of Graviton, can be a Flash memory, i.e., electronically erasable programmable memory.*).

Claims 6, 8-10, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graviton as applied to claim 1 above, and further in view of Yamazaki et al. US 2001/0033963.

Regarding claims 6 and 21, Graviton discloses:

6. The apparatus of claim 1 further comprising a battery ~~secured~~ <u>connected</u> to the first substrate (e.g., pg. 15 lines 14-21: "battery", pg. 15 line 31 – pg. 16 line 3: "the device may be made compact").

21. An apparatus (e.g., Fig. 4 #50: "SENSOR ASSEMBLY") **for use in a building automation system, the building automation system including one or more devices that are operable to generate a control output based on set point information and process value information from one or more sensors** (*Statement of intended use in the preamble, no patentable weight.*), **the apparatus comprising:**

at least one microelectromechanical (MEMs) sensor device operable to generate a process value device (e.g., Fig. 4 #52: "CANTILEVER CHIP", pg. 18 lines 16-17: "The various sensors 52, 100 and actuators 92 may be implemented through various microelectromechanical devices, also known as MEMS.");

a processing circuit operably connected to the at least one MEMs sensor device to receive the process value therefrom (e.g., Fig. 4 #56: "ADC", Fig. 4 #60:

"PROCESSOR")**, the processing circuit configured to convert the process value to an output digital signal** (e.g., pg. 4 lines 15-24, pg. 15 lines 21-30) **configured to be communicated to another element of the building automation system** (e.g., pg. 6 lines 19-29: "The actuator commands may be received via...another sensor assembly")**;**

a battery operably connected to provide power to at least the processing circuit (e.g., pg. 15 lines 14-21: "battery")**; and wherein the at least one MEMs sensor device and the processing circuit are integrated onto a first substrate** (e.g., pg. 15 line 31 – pg. 16 line 3: "The system preferably includes a single chip including both the sensor, required logic components or processing components, e.g., microprocessor, and a wireless transmission component, e.g., radio frequency generator, all included within a single chip. By integrating the sensing, processing (optional memory), and transmission functionalities, the device may be made compact and robust.")~~**; and wherein the battery is secured between the first substrate and a second substrate of the apparatus.**~~

Graviton does not explicitly disclose that the battery is secured to the first substrate (claims 6), or that the battery is a lithium ion battery (claims 8, 23) coupled to a power management circuit (claims 9, 24), and disposed between a first and second substrate (claims 10 and 21), wherein the second substrate is a semiconductor substrate (claim 22).

However, Yamazaki et al. discloses a layered substrate with a lithium ion battery (e.g., Fig. 1 #16, 18, 20) secured and disposed between a first and second substrate (e.g., [0060], Fig. 1 #12, 14, 24, 26, 28), and coupled to a power management circuit (e.g., [0034]: "charging circuit"), wherein the second substrate is a semiconductor substrate (e.g., col. 2 lines 42-50: "ICs 24 and 26", "reference number 28 is an IC").

Graviton and Yamazaki et al. are analogous art since both pertain to substrates on which electronic parts are mounted, specifically to substrates used for compact electronic devices (e.g., [0002] of Yamazaki et al. and pg. 15 line 31 – pg. 16 line 3 of Graviton: "the device may be made compact").

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Graviton with Yamazaki et al. since Yamazaki et

al. teaches that sheet batteries can be used to reduce the size and thickness of a compact electronic device (e.g., [0007]), and since power for parts on the substrates can be directly supplied from the battery of the layered substrate (e.g., [0009]), and since wiring can be simplified with sheet batteries (e.g., [0009]), and since a power management circuit means that sheet batteries can be reused (e.g., [0034]), and since disposing a sheet battery between a noise source substrate and a substrate from which one desires to prevent the effects of noise enables little noise effects to be provided without using an electromagnetic shielding plate (e.g., [0060]).

Claims 6, 8, and 9 are additionally rejected under 35 U.S.C. 103(a) as being unpatentable over Graviton as applied to claim 1 above, and further in view of Doherty et al.

Graviton does not explicitly disclose that the battery is secured to the first substrate (claim 6), or that the battery is a lithium ion battery (claim 8) coupled to a power management circuit (claim 9).

Doherty et al. discloses "smart dust" wireless integrated network sensors comprising a battery secured to a first substrate (e.g., Fig. 1: "Thick-Film Battery", *The battery is secured to the substrate via the power capacitor.*), wherein the battery is a lithium ion battery (e.g., pg. 122 col. 2: "lithium energy cell") coupled to a power management circuit (e.g., pg. 132 col. 1: "It is essential that nodes be powered down whenever possible to conserve energy…robust and efficient wake-up algorithms").

Graviton and Doherty et al. are analogous art since both pertain to wireless integrated network sensors used in a building automation environment.

It would have been obvious to one having ordinary skill in the art the time the invention was made to modify Graviton with Doherty et al. in order to make the device of Graviton as compact as possible by vertically securing the integrated circuit substrate to the battery, as taught by Doherty et al.

Rejections based on Doherty et al.

Claims 1, 2, 5-9, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doherty et al. in view of UC Berkeley (or Jacobsen).

Regarding claims 1, 2, 5-9, and 11, Doherty et al. discloses:

1. **An apparatus** (e.g., Fig. 1: "node") **for use in a building automation system, the building automation system including one or more devices that are operable to generate control outputs based on set point information and process value information from one or more sensors, the building automation system further including one or more actuators operable to perform an operation responsive to at least some of the control outputs** (*Statements of intended use in the preamble or statements that don't limit the structure of the claimed "apparatus" are not given patentable weight. The "building automation system including one or more devices" is external to the claimed "apparatus" and does not limit the claimed "apparatus".*)**, the apparatus comprising:**

at least one microlectromechanical (MEMs) sensor device operable to generate a process value (e.g., pg. 121 col. 2: "MEMS-based (Micro-ElectroMechanical System) sensors")**;**

a processing circuit configured to cause an output digital signal (e.g., Fig. 1: "analog-to-digital converter") **to be communicated to another element of the building automation system** (e.g., Section 6.1: "The role of the sensor network in this context is to measure the conditions for each worker and to communicate this information to a centralized computer for actuation of heating units, humidifiers, fans, and lights to best accommodate the current denizens of the workspace")**; and**

wherein the at least one MEMs sensor device and the processing circuit are integrated onto a first substrate (e.g., pg. 121 col. 2: "The MEMS-based (Micro-ElectroMechanical System) sensors and integrated circuitry for processing and RF communication can all be mass produced on the same silicon substrate.")**;**

wherein ~~the processing circuit~~ a centralized controller is further configured to generate the output digital signal including a first control output (e.g., Section 6.1: "a centralized computer for actuation of heating units, humidifiers, fans, and lights to best

accommodate the current denizens of the workspace") **based on at least one set point** (e.g., Section 6.1: "individual preferences for temperature, humidity, and light level") **and the process value obtained from the at least one MEMs sensor device** (e.g., Section 6.1: "The role of the sensor network in this context is to measure the conditions for each worker and to communicate this information to a centralized computer").

2. The apparatus of claim 1 wherein the processing circuit includes a microelectronics A/D converter, the microelectronics A/D converter operable to receive the process value from the at least one MEMs sensor device and generate a digital sensor signal therefrom (e.g., Fig. 1: "analog-to-digital converter").

5. The apparatus of claim 1 wherein the at least one MEMs sensor device includes a plurality of MEMs sensor devices (e.g., Fig. 1: "sensor").

6. The apparatus of claim 1 further comprising a battery secured to the first substrate (e.g., Fig. 1: "Thick-Film Battery", *The battery is secured to the substrate via the power capacitor.*).

7. The apparatus of claim 1 wherein the first substrate is a semiconductor substrate (e.g., pg. 121 col. 2: "silicon substrate").

8. The apparatus of claim 6 wherein the battery further comprises a lithium ion battery layer (e.g., pg. 122 col. 2: "lithium energy cell").

9. The apparatus of claim 8 further comprising a power management circuit operably coupled to the lithium ion battery layer (e.g., pg. 132 col. 1: "It is essential that nodes be powered down whenever possible to conserve energy…robust and efficient wake-up algorithms").

11. The apparatus of claim 1 further comprising an RF communication circuit operably coupled to the processing circuit (e.g., Section 5.1: "RF Communication"), **the RF communication circuit operably connected to provide the output digital signal go the other element of the building automation system** (e.g., Section 6.1: "The role of the sensor network in this context is to measure the conditions for each worker and to communicate this information to a centralized computer for actuation of heating units, humidifiers, fans, and lights to best accommodate the current denizens of the workspace").

Regarding claim 1, as noted above, Doherty et al. does not specifically disclose that it is the "smart dust" node processing circuit that generates the first control output based on the at least one set point and the process value obtained from the at least one MEMs sensor device.

Rather, Doherty et al. discloses that a centralized computer performs this function (Section 6.1). Although Doherty et al. teaches that the brunt of the network's work should be done locally to minimize the communication costs of sending unnecessary information, Doherty et al. also acknowledges that memory and hardware limitations may impose constraints on the types of computation that are possible on individual sensor nodes (pg. 132), which is apparently why Doherty et al. chooses to generate the actuator control outputs (based on at the least one set point and the sensor process value) at the centralized computer instead of at the smart dust mote itself.

UC Berkeley discloses a smart building using "smart dust" motes that keep a "constant vigil on light and temperature conditions" (pg. 2). UC Berkeley also teaches the desire to evolve passive sensors into more active sensors, and discloses that these active smart dust motes could then intelligently cut power automatically to certain devices during times of peak power demand (pg. 2). Thus, UC Berkeley discloses smart dust motes that can generate and output actuator control signals at the mote itself, instead of at a centralized computer as disclosed by Doherty et al.

Doherty et al. and UC Berkeley are analogous art since both pertain to "smart dust" employed in a smart building automation system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus processing circuit of Doherty et al. to enable it to generate the first control output based on the at least one set point and the sensor process value (instead of or in addition to having the first control output being generated at the centralized controller) since UC Berkeley teaches that "everything should have its own built-in intelligence" (page 2), and since Doherty et al. teaches that, "Whenever possible, the brunt of the network's work should be done locally to minimize the communication costs of sending unnecessary information" (pg. 132). Thus, such a

modification would allow the centralized controller of Doherty et al. to be bypassed altogether, and would minimize costs.

Jacobsen discloses smart sensors for distributed control networks in building control and monitoring systems. These smart sensor nodes contain local intelligence that not only allows the sensing node to receive and send data digitally, but also to receive and send *control commands*. These control commands can include commands to drive an actuator in a building control and monitoring environment (pg. 285 col. 1).

Doherty et al. and Jacobsen are analogous are since both pertain to network sensors employed in a building control and monitoring system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus processing circuit of Doherty et al. to enable it to generate the first control output based on the at least one set point and the sensor process value (instead of or in addition to having the first control output being generated at the centralized controller) since Doherty et al. teaches that, "Whenever possible, the brunt of the network's work should be done locally to minimize the communication costs of sending unnecessary information" (pg. 132). Thus, such a modification would allow the centralized controller of Doherty et al. to be bypassed altogether, and would minimize costs.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doherty et al. in view of UC Berkeley (or Jacobsen) as applied to claim 8 above, and further in view of Yamazaki et al. US 2001/0033963.

Doherty et al. as modified by UC Berkeley (or Jacobsen) does not appear to disclose that the "smart dust" mote comprises a second substrate, wherein the lithium ion battery layer is disposed between the first substrate and the second substrate.

However, Yamazaki et al. discloses a layered substrate with a lithium ion battery (e.g., Fig. 1 #16, 18, 20) secured and disposed between a first and second substrate (e.g., [0060], Fig. 1 #12, 14, 24, 26, 28), and coupled to a power management circuit (e.g., [0034]: "charging circuit").

Doherty et al. as modified by UC Berkeley (or Jacobsen), and Yamazaki et al., are analogous art since both pertain to substrates on which electronic parts are mounted, specifically to substrates used for compact electronic devices (e.g., [0002] of Yamazaki et al.).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Doherty et al. as modified by UC Berkeley (or Jacobsen) with Yamazaki et al. since Yamazaki et al. teaches that sheet batteries can be used to reduce the size and thickness of a compact electronic device (e.g., [0007]), and since power for parts on the substrates can be directly supplied from the battery of the layered substrate (e.g., [0009]), and since wiring can be simplified with sheet batteries (e.g., [0009]), and since a power management circuit means that sheet batteries can be reused (e.g., [0034]), and since disposing a sheet battery between a noise source substrate and a substrate from which one desires to prevent the effects of noise enables little noise effects to be provided without using an electromagnetic shielding plate (e.g., [0060]).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doherty et al. as modified by UC Berkeley (or Jacobsen) as applied to claim 1 above, and further in view of Hill et al.

Doherty et al. as modified by UC Berkeley (or Jacobsen) does not appear to explicitly disclose an EEPROM operably coupled to the processing circuit.

Doherty et al. as modified by UC Berkeley (or Jacobsen) discloses that the processor design can follow the Harvard architecture and utilize two separate memories – one for the program and one for data (pg. 125 col. 1 of Doherty et al.). It is well known that in Harvard architectures, instructions are generally stored in a non-volatile read-only memory (such as EEPROM) while data memory generally requires random-access memory.

For example, Hill et al. discloses a system Harvard architecture (e.g., Section 3.1: "8-bit Harvard architecture") for wireless integrated network sensors (smart dust motes) comprising a programmable non-volatile memory operably coupled to the processing circuit, wherein the programmable non-volatile memory comprises an EEPROM (Section

3: "It consists of a microcontroller with internal flash program memory, data SRAM, and data EEPROM").

Doherty et al. as modified by UC Berkeley (or Jacobsen), and Hill et al., are analogous art since both pertain to smart dust motes, and are authored by some overlapping author(s).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Doherty et al. as modified by UC Berkeley (or Jacobsen) with Hill et al. since Hill et al. teaches that an EEPROM would allow the sensor of Doherty et al. as modified by UC Berkeley (or Jacobsen) to be reprogrammed by transferring data from the network into the EEPROM (Section 3.1).

Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doherty et al. in view of Yamazaki et al. US 2001/0033963.

Doherty et al. teaches:

21. An apparatus (e.g., Fig. 1: "node") **for use in a building automation system, the building automation system including one or more devices that are operable to generate a control output based on set point information and process value information from one or more sensors** (*Statements of intended use in the preamble or statements that don't limit the structure of the claimed "apparatus" are not given patentable weight. The "building automation system including one or more devices" is external to the claimed "apparatus" and does not limit the claimed "apparatus".*), **the apparatus comprising:**

at least one microelectromechanical (MEMs) sensor device operable to generate a process value (e.g., pg. 121 col. 2: "MEMS-based (Micro-ElectroMechanical System) sensors");

a processing circuit operably connected to the at least one MEMs sensor device to receive the process value therefrom, the processing circuit configured to convert the process value to an output digital signal (e.g., Fig. 1: "analog-to-digital converter") **configured to be communicated to another element of the building automation system** (e.g., Fig. 1: "communications devices", Section 6.1: "The role of

the sensor network in this context is to measure the conditions for each worker and to communicate this information to a centralized computer for actuation of heating units, humidifiers, fans, and lights to best accommodate the current denizens of the workspace", *Intended use of the claimed "output digital signal", not positively recited.*);

a battery operably connected to provide power to at least the processing circuit (e.g., Fig. 1: "Thick-Film Battery")**; and**

wherein the at least one MEMs sensor device and the processing circuit are integrated onto a first substrate (e.g., pg. 121 col. 2: "The MEMS-based (Micro-ElectroMechanical System) sensors and integrated circuitry for processing and RF communication can all be mass produced on the same silicon substrate.")**, and wherein the battery is secured <u>to</u> ~~between~~ the first substrate** (e.g., Fig. 1: "Thick-Film Battery", *The battery is secured to the substrate via the power capacitor.*) **~~and a second substrate of the apparatus~~.**

22. ~~The apparatus of claim 21 wherein the second substrate is a semiconductor substrate.~~

23. The apparatus of claim 21 wherein the battery further comprises a lithium ion battery (e.g., pg. 122 col. 2: "lithium energy cell")**.**

24. The apparatus of claim 23 further comprising a power management circuit operably coupled to the lithium ion battery layer (e.g., pg. 132 col. 1: "It is essential that nodes be powered down whenever possible to conserve energy…robust and efficient wake-up algorithms")**.**

Regarding claims 21 and 22, as noted above via strikethrough, Doherty et al. does not disclose that the smart dust mote comprises a second substrate, wherein the battery is disposed between the first substrate and the second substrate (claim 21), wherein the second substrate is a semiconductor substrate (claim 22). Rather, Doherty et al. only discloses that the battery is secured to a first semiconductor substrate (Fig. 1).

However, Yamazaki et al. discloses a layered substrate with a lithium ion battery (e.g., Fig. 1 #16, 18, 20) secured and disposed between a first and second substrate (e.g., [0060], Fig. 1 #12, 14, 24, 26, 28), and coupled to a power management circuit (e.g.,

[0034]: “charging circuit”), wherein the second substrate is a semiconductor substrate (e.g., col. 2 lines 42-50: "ICs 24 and 26", "reference number 28 is an IC").

Doherty et al. and Yamazaki et al. are analogous art since both pertain to substrates on which electronic parts are mounted, specifically to substrates used for compact electronic devices (e.g., [0002] of Yamazaki et al.).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Doherty et al. with Yamazaki et al. since Yamazaki et al. teaches that sheet batteries can be used to reduce the size and thickness of a compact electronic device (e.g., [0007]), and since power for parts on the substrates can be directly supplied from the battery of the layered substrate (e.g., [0009]), and since wiring can be simplified with sheet batteries (e.g., [0009]), and since a power management circuit means that sheet batteries can be reused (e.g., [0034]), and since disposing a sheet battery between a noise source substrate and a substrate from which one desires to prevent the effects of noise enables little noise effects to be provided without using an electromagnetic shielding plate (e.g., [0060]).

Claims 26, 27, and 29-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doherty et al. in view of Hill et al.

Regarding claims 26 and 29-32, Doherty et al. discloses:

26. An apparatus (e.g., Fig. 1: “node”) **for use in a building automation system, the building automation system including one or more devices that are operable to generate a control output based on set point information and process value information from one or more sensors** (*Statements of intended use in the preamble or statements that don’t limit the structure of the claimed “apparatus” are not given patentable weight. The “building automation system including one or more devices” is external to the claimed “apparatus” and is not given patentable weight.*)**, the apparatus comprising:**

at least one microelectromechanical (MEMs) sensor device operable to generate a process value (e.g., pg. 121 col. 2: “MEMS-based (Micro-ElectroMechanical System) sensors”)**;**

a processing circuit operably connected to the at least one MEMS sensor device to receive the process value therefrom, the processing circuit configured to convert the process value to an output digital signal (e.g., Fig. 1: "analog-to-digital converter") **configured to be communicated to another element of the building automation system** (e.g., Fig. 1: "communications devices", *Intended use of the claimed "output digital signal".*)**;**

a programmable ~~non-volatile~~ memory (e.g., pg. 125 col. 1: "A low-power processor design would follow the Harvard architecture and utilize two separate memories – one for the program and one for the data.")**, operably coupled to the processing circuit and supported by the first substrate** (e.g., pg. 121 col. 2: "The MEMS-based (Micro-ElectroMechanical System) sensors and integrated circuitry for processing and RF communication can all be mass produced on the same silicon substrate.")**, wherein the programmable ~~non-volatile~~ memory stores configuration information relating to the apparatus** (e.g., pg. 125 col. 1: "two separate memories – one for the program and one for the data", *function limitation of memory*)**; and**

wherein the at least one MEMS sensor device and the processing circuit are integrated onto a first substrate (e.g., pg. 121 col. 2: "The MEMS-based (Micro-ElectroMechanical System) sensors and integrated circuitry for processing and RF communication can all be mass produced on the same silicon substrate.")**.**

29. The apparatus of claim 28, wherein the configuration information includes identification information for the apparatus (*Apparatus claims must be structurally distinguishable from the prior art. This is an intended use/functional limitation of the "memory". The prior art "memory" of Doherty et al. is capable of storing many types of information, including identification information.*)**.**

30. The apparatus of claim 29, wherein the configuration information includes a network address corresponding to the apparatus (*Apparatus claims must be structurally distinguishable from the prior art.*)**.**

31. The apparatus of claim 28, wherein the configuration information includes function enabling information, the function identifying information identifying as

enabled less than all of the possible sensing functions available to be enabled on the sensor (*Apparatus claims must be structurally distinguishable from the prior art.*).

32. The apparatus of claim 28, wherein the configuration information includes system RF communication parameters (*Apparatus claims must be structurally distinguishable from the prior art.*).

Regarding claims 26, 27, and 33-36, Doherty et al. does not appear to explicitly disclose that the memory is a programmable non-volatile memory (claim 26), such as an EEPROM (claims 27 and 33-36).

Doherty et al. discloses that the processor design can follow the Harvard architecture and utilize two separate memories – one for the program and one for data (pg. 125 col. 1). It is well known that in Harvard architectures, instructions are generally stored in a non-volatile read-only memory while data memory generally requires random-access memory.

For example, Hill et al. discloses a system Harvard architecture (e.g., Section 3.1: "8-bit Harvard architecture") for wireless integrated network sensors (smart dust motes) comprising a programmable non-volatile memory operably coupled to the processing circuit, wherein the programmable non-volatile memory comprises an EEPROM (Section 3: "It consists of a microcontroller with internal flash program memory, data SRAM, and data EEPROM").

Doherty et al. and Hill et al. are analogous art since both pertain to smart dust motes, and are authored by some overlapping author(s).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Doherty et al. with Hill et al. since Hill et al. teaches that an EEPROM would allow the sensor of Doherty et al. to be reprogrammed by transferring data from the network into the EEPROM (Section 3.1).

Rejections based on Asada et al.

Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asada et al. in view of Yamazaki et al. US 2001/0033963.

Asada discloses:

21. An apparatus (e.g., Fig. 1: “wireless integrated network sensor”) **for use in a building automation system, the building automation system including one or more devices that are operable to generate a control output based on set point information and process value information from one or more sensors** (EN: *Statements of intended use in the preamble or statements that don’t limit the structure of the claimed “apparatus” are not given patentable weight. The “building automation system including one or more devices” is external to the claimed “apparatus”.*)**, the apparatus comprising:**

at least one microelectromechanical (MEMs) sensor device operable to generate a process value (e.g., Fig. 1, Fig. 7: “sensor”, Section 4: “MEMS”)**;**

a processing circuit operably connected to the at least one MEMs sensor device to receive the process value therefrom, the processing circuit configured to convert the process value to an output digital signal (e.g., Fig. 1, Fig. 7: “ADC”) **configured to be communicated to another element of the building automation system** (e.g., Fig. 1, Fig. 7: “control”, “network interface”, Section 3: “Protocols for node operation then determine whether a remote user or neighboring WINS node should be alerted. The WINS node then supplies an attribute of the identified event, for example, the address of the event in an event look-up table stored in all network nodes.”, EN: *Intended use of the claimed “output digital signal”.*)**;**

a battery operably connected to provide power to at least the processing circuit (e.g., Section 3: “sensor nodes powered by compact battery cells”)**; and**

wherein the at least one MEMs sensor device and the processing circuit are integrated onto a first substrate (e.g., Section 4: “This sensor-substrate “sensorstrate” is then a platform for support of interface, signal processing, and communication circuits”)**, and wherein the battery is secured <u>to</u> ~~between~~ the first substrate** (e.g., Section 3:

"sensor nodes powered by compact battery cells") ~~**and a second substrate of the apparatus.**~~

~~**22. The apparatus of claim 21 wherein the second substrate is a semiconductor substrate.**~~

23. The apparatus of claim 22 wherein the battery further comprises a lithium ion battery (e.g., Section 3: "Li coin cells").

24. The apparatus of claim 23 further comprising a power management circuit operably coupled to the lithium ion battery layer (e.g., Section 2: "low power sensor interface and signal processing architecture and circuits enable continuous low power monitoring").

Regarding claims 21 and 22, and as noted above via strikethroughs, Asada et al. does not disclose that the smart dust mote comprises a second substrate, wherein the lithium ion battery layer is secured between the first substrate and the second substrate (per claim 21), wherein the second substrate is a semiconductor substrate (per claim 22).

However, Yamazaki et al. discloses a layered substrate with a lithium ion battery (e.g., Fig. 1 #16, 18, 20) secured and disposed between a first and second substrate (e.g., [0060], Fig. 1 #12, 14, 24, 26, 28), and coupled to a power management circuit (e.g., [0034]: "charging circuit").

Asada et al. and Yamazaki et al. are analogous art since both pertain to substrates on which electronic parts are mounted, specifically to substrates used for compact electronic devices (e.g., [0002] of Yamazaki et al.).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Asada et al. with Yamazaki et al. since Yamazaki et al. teaches that sheet batteries can be used to reduce the size and thickness of a compact electronic device (e.g., [0007]), and since power for parts on the substrates can be directly supplied from the battery of the layered substrate (e.g., [0009]), and since wiring can be simplified with sheet batteries (e.g., [0009]), and since a power management circuit means that sheet batteries can be reused (e.g., [0034]), and since disposing a sheet battery between a noise source substrate and a substrate from which one

desires to prevent the effects of noise enables little noise effects to be provided without using an electromagnetic shielding plate (e.g., [0060]).

Claim 26, 27, and 29-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asada et al. in view of Hill et al.

Asada et al. discloses most all features of these claims as detailed above, including a memory operably coupled to the processing circuit and supported by the first substrate, wherein the memory stores configuration information relating to the apparatus (e.g., Fig. 1: "buffer", *functional limitation of memory: memory of Asada capable of storing numerous types of data*).

Asada et al. does not specifically disclose that the memory is a programmable non-volatile memory (claim 26), wherein the programmable non-volatile memory comprises an EEPROM (claims 27).

Hill et al. discloses a system Harvard architecture (e.g., Section 3.1: "8-bit Harvard architecture") for wireless integrated network sensors comprising a programmable non-volatile memory operably coupled to the processing circuit, wherein the programmable non-volatile memory comprises an EEPROM (Section 3: "It consists of a microcontroller with internal flash program memory, data SRAM, and data EEPROM").

Asada et al. and Hill et al., are analogous art since both pertain to wireless integrated network sensors.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Asada et al. with Hill et al. since Hill et al. teaches that an EEPROM would allow the sensor of Asada et al. to be reprogrammed by transferring data from the network into the EEPROM (Section 3.1).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan A. Jarrett whose telephone number is (571) 272-3742. The examiner can normally be reached on 10:00-6:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ryan A. Jarrett/
Primary Examiner, Art Unit 2121

04/04/08